

CLAIMS

What is claimed is:

1. A method for quantification of strain imaging comprising the steps of:
 - (a) performing a motion analysis on at least two selected regions of interest (ROI) before and after tissue compression;
 - (b) providing a strain estimate for each of the at least two ROIs; and
 - (c) comparing the strain estimates of each of the at least two ROIs to quantify the strain for the at least two ROIs.

2. The method of claim 1 wherein the performing step (a) comprises the steps of:

- (a1) generating a plurality of blocks for each of the at least two ROIs; and
- (a2) utilizing a block matching technique to perform a motion analysis on each of the at least two ROIs.

3. The method of claim 2 wherein each of the plurality of blocks touch a boundary of the at least two ROIs.

4. The method of claim 1 wherein the providing step (206) (b) is performed in accordance with the equation:

$$ST = \left\| \sum_{i=i_1}^{i_2} \frac{(a_i - b_i)}{d_i} \right\| \times 100\%$$

where ST is the strain estimate; and where a_i and b_i are the displacement components for two blocks, which cross over the boundary of a specific ROI, in the direction of i -th A-line, d_i is a

7 distance between the two blocks, and i_1 and i_2 are indices along an A-line on a B-mode image
8 covering the ROI.

1 5. A method for quantification of strain imaging comprising the steps of:

2 (a) performing (206) a motion analysis on a plurality of selected regions of interest
3 (ROIs) (302 and 304); the performing step (a) further comprises the steps of: (a1) generating a
4 plurality of blocks (150) for each of the at least two ROIs (302 and 304); and (a2) utilizing a
5 block matching technique to perform a motion analysis on each of the plurality of ROIs (302
6 and 304), wherein each of the plurality of blocks (150) touch a boundary of the at least two
7 ROIs (302 and 304);
8 (b) providing a strain estimate for each of the plurality of ROIs (302 and 304); and
9 (c) comparing (208) the strain estimates of each of the plurality of ROIs to quantify
10 the strain for the at least two ROIs (302 and 304).

1 6. The method of claim 5 where the strain estimate is performed in accordance with
2 the equation:

$$ST = \left\| \sum_{i=i_1}^{i_2} \frac{(a_i - b_i)}{d_i} \right\| \times 100\%$$

3 where ST is the strain estimate; and where a_i and b_i are the displacement components for
4 two blocks, which cross over the boundary of a specific ROI, in the direction of i -th A-line. d_i is
5 a distance between the two blocks, and i_1 and i_2 are indices along an A-line on a B-mode image
6 covering that specific ROI.

7 7. A computer readable medium for quantification of strain imaging including
8 program instructions for:

3 (a) performing (204) a motion analysis on at least two selected regions of interest
4 (ROI) before and after tissue compression;
5 (b) providing (206) a strain estimate for each of the at least two ROIs; and

6 (c) comparing (208) the strain estimates of each of the at least two ROIs to quantify
7 the strain for the at least two ROIs.

1 8. The computer readable medium of claim 7 wherein the performing (206) step (a)
2 comprises the steps of:

3 (a1) generating a plurality of blocks (150) for each of the at least two ROIs (302 and
4 304); and

5 (a2) utilizing a block matching technique to perform a motion analysis on each of the
6 at least two ROIs (302 and 304).

1 9. The computer readable medium of claim 7 wherein each of the plurality of
2 blocks touch a boundary of the at least two ROIs (302 and 304).

1 10. The computer readable medium of claim 7 wherein the providing step (206) (b)
2 is performed in accordance with the equation:

$$ST = \left\| \sum_{i=i_1}^{i_2} \frac{(a_i - b_i)}{d_i} \right\| \times 100\%$$

3 where ST is the strain estimate; and where a_i and b_i are the displacement components for
4 two blocks, which cross over the boundary of a specific ROI, in the direction of i -th A-line, d_i is
5 a distance between the two blocks, and i_1 and i_2 are indices along an A-line on a B-mode image
6 covering that specific ROI.

1 11. A computer readable medium for quantification of strain imaging having
2 program instructions for:

3 (a) performing (206) a motion analysis on a plurality of selected regions of interest
4 (ROIs) (302 and 304); the performing step (a) further comprises the steps of: (a1) generating a
5 plurality of blocks (150) for each of the plurality of ROIs (302 and 304);

6 (a2) utilizing a block matching technique to perform a motion analysis on each of the
7 plurality of ROIs (302 and 304), wherein each of the plurality of blocks touch a boundary of the

plurality of ROIs (302 and 304);

(b) ~~providing (206) a strain estimate for each of the plurality of ROIs; and comparing (208) the strain estimates of each of the plurality of ROIs to quantify the strain for the at least two ROIs (302 and 304).~~

12. The computer readable medium of claim 11 where the strain estimate is performed in accordance with the equation:

$$ST = \left\| \sum_{i=i_1}^{i_2} \frac{(a_i - b_i)}{d_i} \right\| x 100\%$$

where ST is the strain estimate; and where a_i and b_i are the displacement components for two blocks, which cross over the boundary of a specific ROI, in the direction of i -th A-line. d_i is a distance between the two blocks, and i_1 and i_2 are indices along an A-line on a B-mode image covering that specific ROI.